

9/3/87

Let's protect our earth



3-9

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF HAZARDOUS WASTE MANAGEMENT

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UOP, Inc.
25 East Algonquin Road
Des Plains, IL 60017-5017

Attention: Mr. L. Geyer, Project Manager

Gentlemen:

RE: UOP Site East Rutherford
Wastewater Lagoons Biodegradation Feasibility Analysis
Document No. P-E197-311A

The New Jersey Department of Environmental Protection (DEP) has reviewed your submission Wastewater Lagoons Biodegradation Feasibility Analysis and Design Optimization Work Plan July 1987 prepared by ERT and has the following comments:

I. Scale-Up Tests - Liquid Matrix (3.4.1)

The schedule of analysis indicates that the priority pollutant scan will be run at the beginning of load 1 and at the end of load 2. This scheme is unacceptable since it would provide neither results for the end-point of load 1 (residual) nor results for the start-up of load 2. Priority pollutants, including metals, must be run at week 3 for the residual material as well as the combined residual plus load 2 (sludge/meadow mat). Additionally, the "clean" excess water which will be drawn off at the end of load 1, must also be analyzed for priority pollutants and COD. A modified Table 3-4 is enclosed.

II. Scale-Up Tests - Solid Matrix (3.4.2)

The schedule of solid matrix analyses and the text indicate that only one priority pollutant (PP) scan will be run for the 3 loads at start-up and one PP scan will be run at the end-point for the load achieving the greatest biodegradation. This scheme is unacceptable since analyses should be performed upon the same load at the beginning and end of the test. Since there is no means of predetermining in advance which sample will biodegrade the most,

all 3 initial loads must be analyzed for PP. When the rates of biodegradation are known, then the single load can be chosen for analysis at the end-point. While this scheme is sufficient, it is suggested that far more information could be obtained by the PP analysis of all 3 loads at end-point. A modified Table 3-5 is enclosed.

III. General Comments

1. The scale-up tests require adjustment of the mixture to pH 7 and ERT proposes using calcium hydroxide. However, since lagoon data from the Phase II report indicates that the media is typically alkaline, the adjustment will probably be acidification.
2. Have volatility controls been incorporated into this feasibility study? During the course of the experiments some constituents will undergo volatilization and will appear to have been biodegraded. Volatility controls should be an integral part of the biodegradation feasibility study so that non-biological contaminant reduction can be assessed.
3. The analytical procedure identified as the Priority Pollutant Scan should be updated to the Hazardous Substance List (HSL + 30) or Target Compound List (TCL + 30). These are the currently acceptable procedures. The analysis must include a library search for non-targeted compounds. This analysis is of importance for the scale-up test, since biodegradation may convert some targeted contaminants to non-targeted ones when complete mineralization does not occur.

Metals were not specified in the analytical plan, but will also be required. It is important at the scale-up test stage to have an idea of the residual concentration of metals for the purpose of evaluating the suitability of the back filling option.

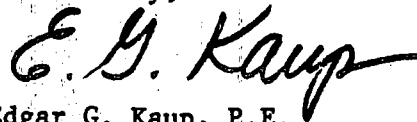
4. The lab to be used for analysis of scale-up test samples is not specified. The lab must be in the CLP program and should be specified before the test begins.
5. In both the liquid and solid matrix scale-up tests, a dilutant, either water or "clean" soil, would be added to the sludge/meadow mat mixture. The effects of adding dilutant materials upon the calculation of biological degradation efficiency must be accounted for and carefully evaluated.

The ultimate goal of the bioremediation of the wastewater lagoons is the reduction of hazardous contamination via the biological conversion of organic contaminants into CO_2 and H_2O (mineralization). The overall

efficiency of this process in scale-up tests will determine the feasibility of using this technology in the field. The NJDEP will only approve the use of this technology if the data obtained are sufficient to assure reasonably successful treatment.

Should you have any questions please contact me at (609) 633-0701.

Yours truly,

A handwritten signature in dark ink, appearing to read "E. G. Kaup". The signature is fluid and cursive, with a long horizontal stroke at the end.

Edgar G. Kaup, P.E.
Case Manager

kaw

Enclosures

c: D. Hart, BCM
K. Schick, BEERA
J. Feldstein, USEPA II

MODIFIED
TABLE 3-4

SCHEDULE OF ANALYSES FOR THE LIQUID MATRIX SCALE-UP TEST

<u>Analysis</u> ¹	<u>Load</u>	<u>End of Week</u>					
		0	1	2	3	4	5
A	1	*		*	*		
	2				*	*	*
B	1	*			*		
C	1				*		
	2				*		
D	1	*			*		
	2				*		*
	+ water				*		

¹Analyses:

See Table 3-3

A = Analyses 1 through 6

B = Analysis 7a (oil & grease)

C = Analysis 7B (BTX)

D = Analysis 8 (HSL + 30)

+ Dilutant Water to be analyzed for COD also

MODIFIED
TABLE 3-5

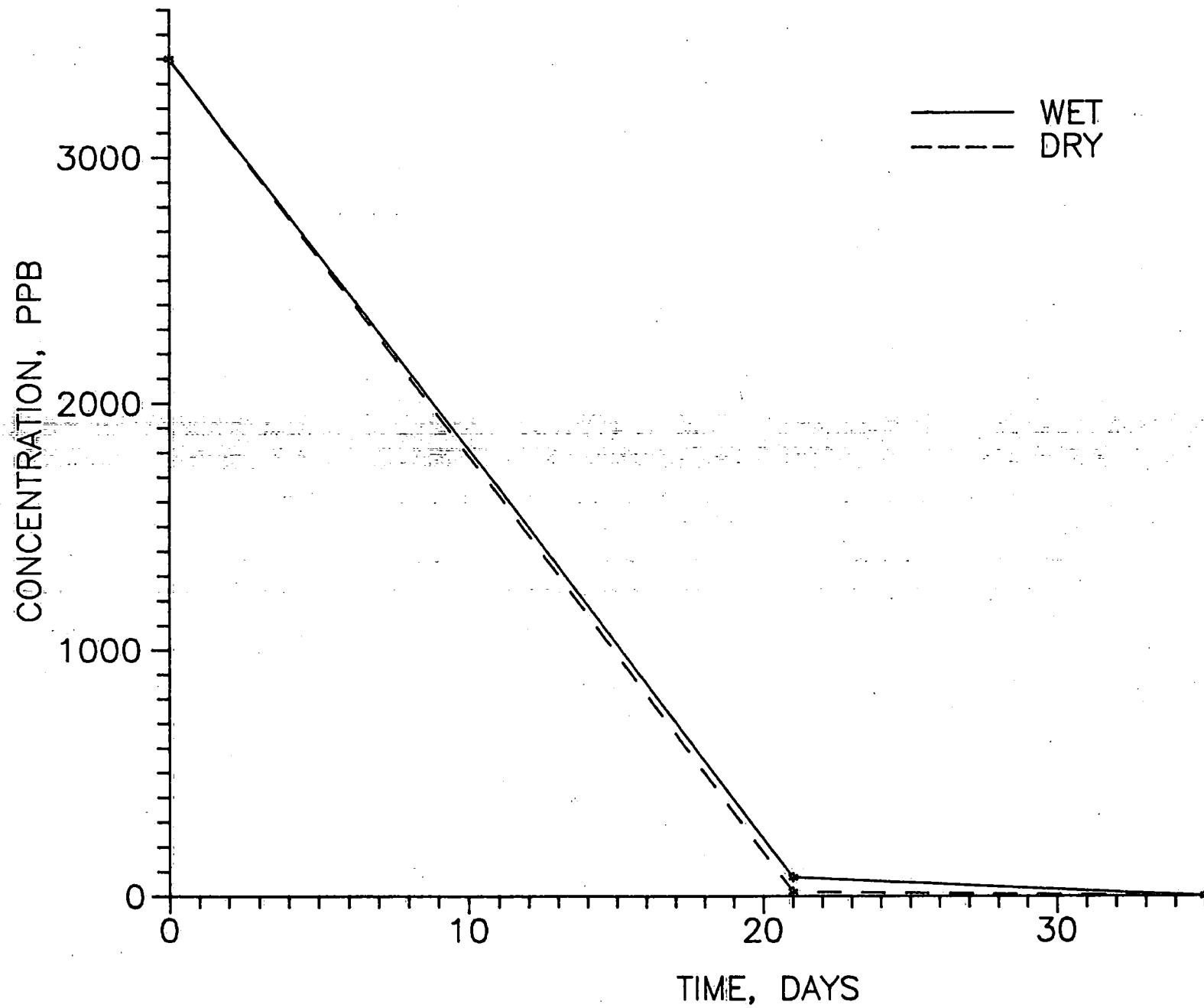
SCHEDULE OF ANALYSES FOR THE SOLID MATRIX SCALE-UP TEST

<u>Analysis</u> ¹	<u>Load</u>	<u>End of Week</u>					
		0	1	2	3	4	5
A	1	*	*	*	*		*
	2	*	*	*	*		*
	3	*	*	*	*		*
B	1	*			*		*
	2				*		
	3				*		
C	1				*		
	2				*		
	3				*		
D	1	*					(*) ²
	2	*					(*)
		*					(*)

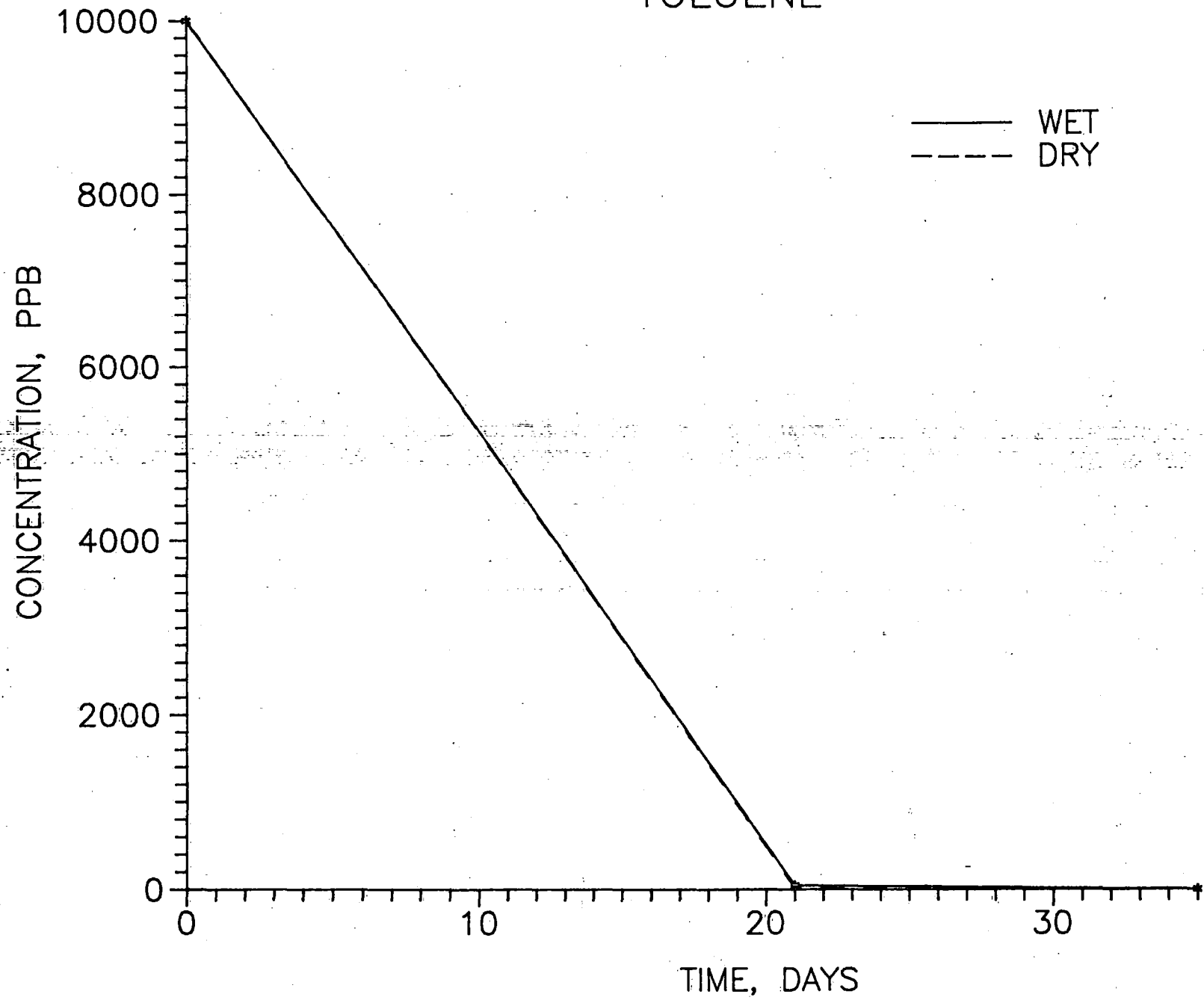
¹Analyses: A = Microtox Bioassay
B = Petroleum Oil & Grease
C = BTX
D = HSL + 30

²(*) Perform Priority Pollutant Scan on the one load that displays the greatest biodegradation progress. All 3 preferred.

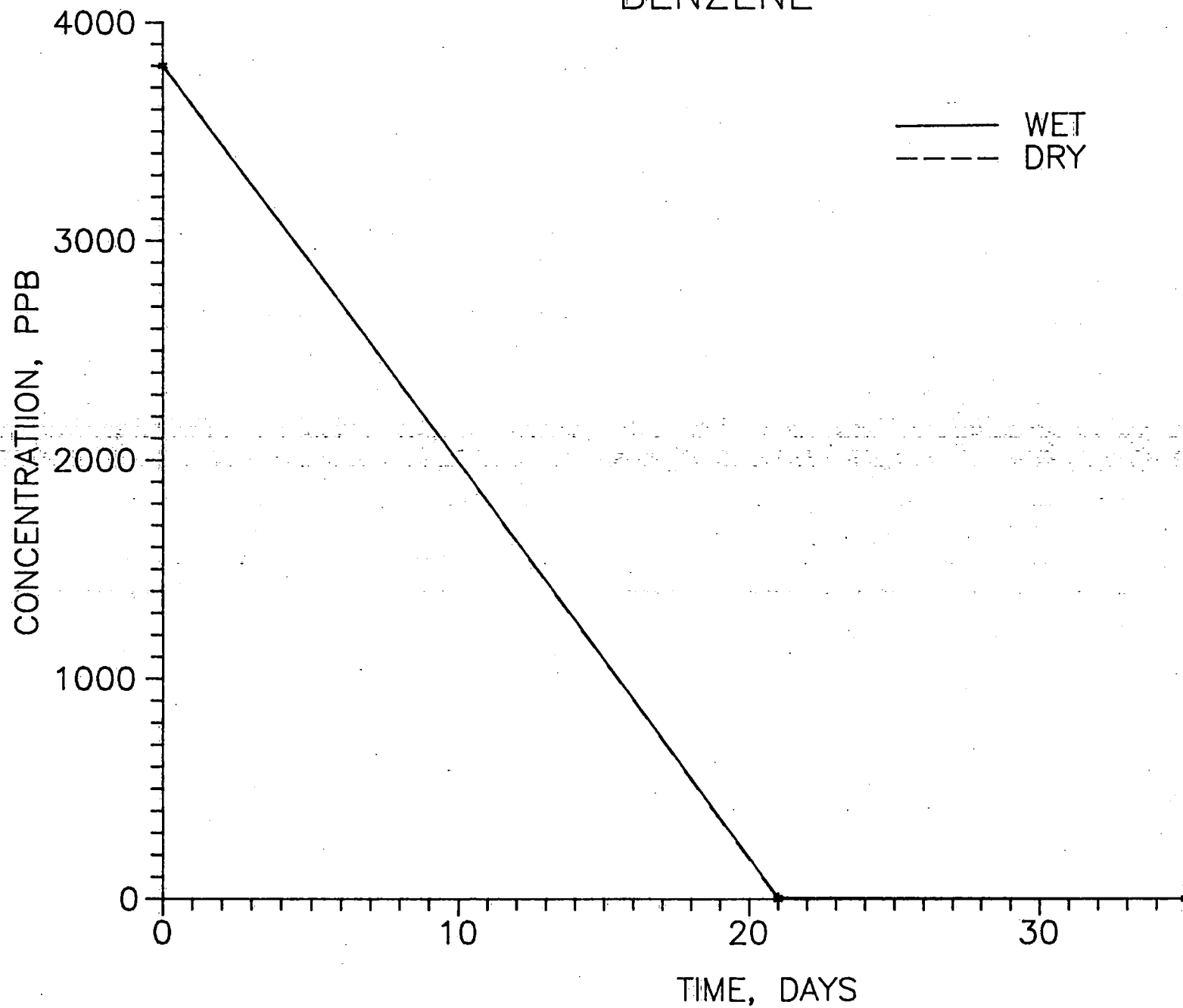
XYLENE

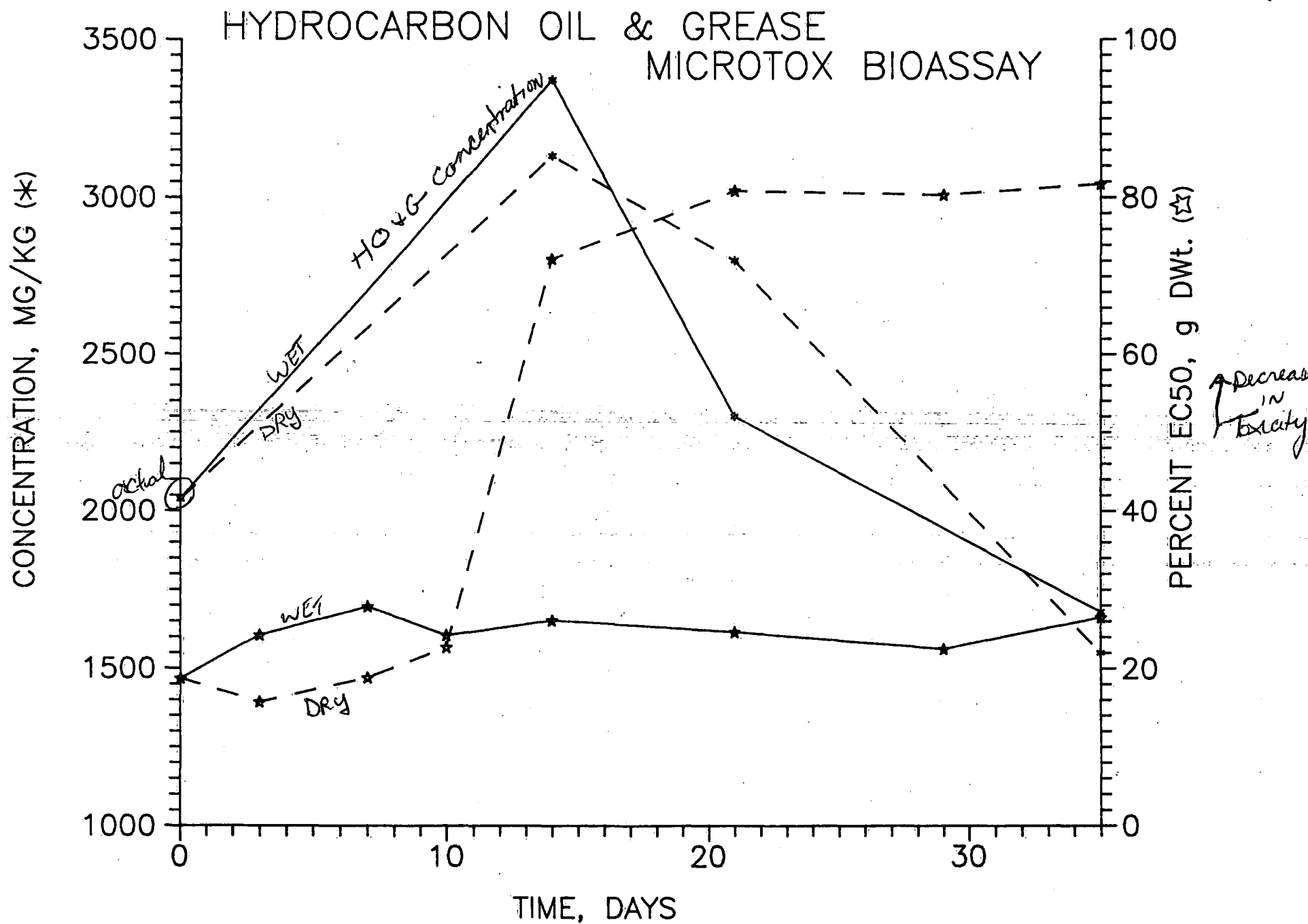


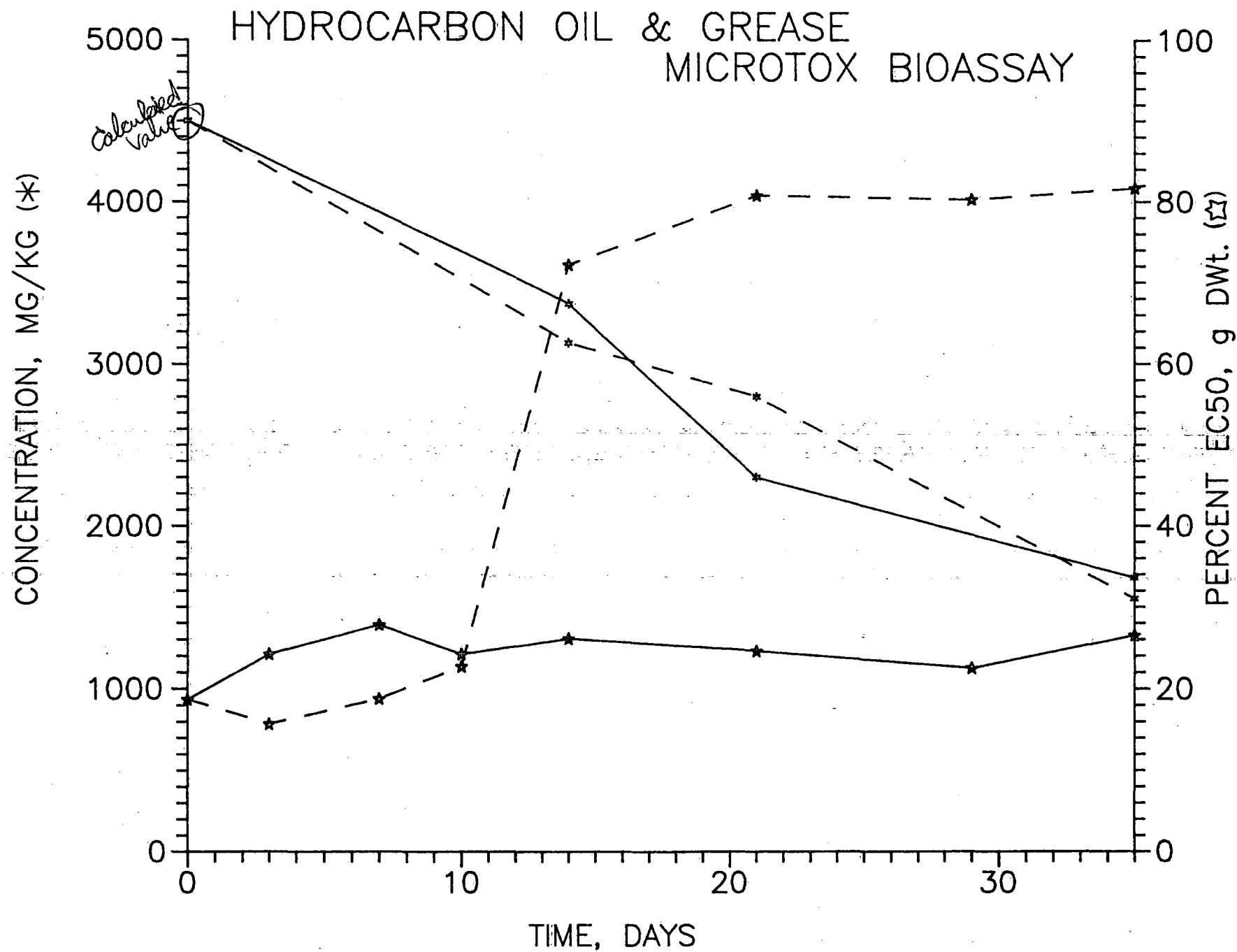
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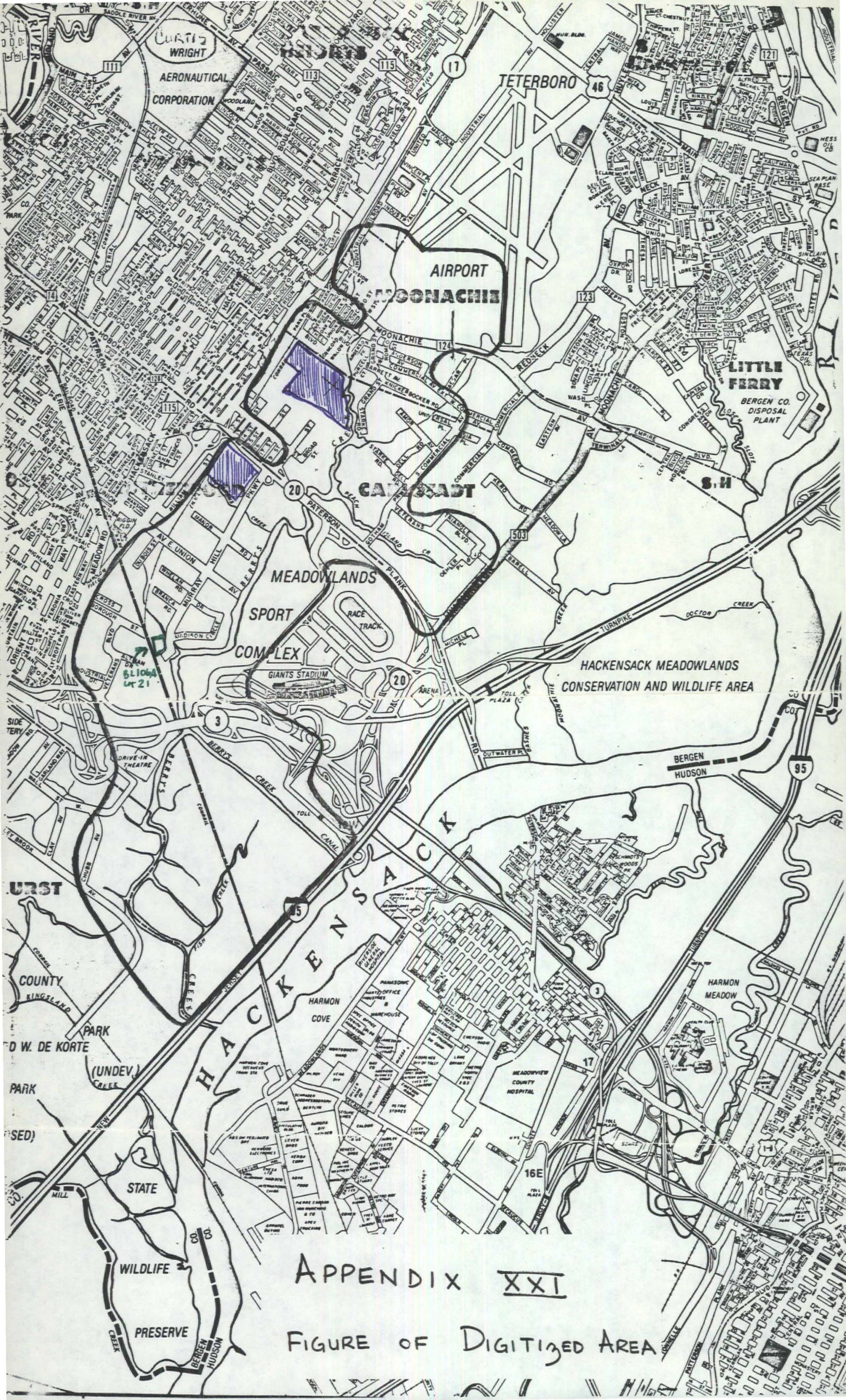


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APPENDIX XXI

FIGURE OF DIGITIZED AREA